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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,507

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EXAMINER

AMARI, ALESSANDRO V

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/572,507	Applicant(s) TSUKAGOSHI ET AL.	
	Examiner ALESSANDRO AMARI	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 is/are allowed.
- 6) ☒ Claim(s) 1,2 and 8 is/are rejected.
- 7) ☒ Claim(s) 3-7,9 and 11-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/17/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 8 and 9 are objected to because of the following informalities: In regard to claim 8, lines 9-10, the phrase, "the information is phase-code-multiplex-recorded in the holographic recording medium in advance" is ambiguous and confusing since the specification refers to the phase mask being recorded as a hologram in advance not the holographic recording being recorded in advance. Claim 9 inherits the same issue. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Curtis US 6,909,529.

In regard to claim 1, Curtis discloses (see for example, Figs. 4, 13) a holographic recording method comprising: branching a laser beam (110) into a reference beam (140) and an object beam (142); guiding the reference beam to a reference optical

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system (114, 118, 122), and at the same time guiding the object beam to an object optical system (126, 120, 122); phase-spatial-modulating the reference beam in the reference optical system (via 116 or 316); amplitude- spatial-modulating the object beam in the object optical system (via 128); and projecting each of the beams onto a holographic recording medium (124) to thereby record interference fringes, wherein the reference beam is phase-spatial-modulated in the reference optical system by means of a phase code mask in which a required phase code pattern is recorded as a hologram in advance as described in column 5, lines 42-67 and column 16, lines 1-19.

In regard to claim 2, Curtis discloses (see for example, Figs. 4, 13) a holographic recording apparatus, comprising: a laser beam source (110); a reference optical system (114, 118, 122) which guides one of branched laser beams resulting from branching a laser beam from this laser beam source to a holographic recording medium as a reference beam (140); an object optical system 126, 120, 122) which guides the other of the branched laser beams to the holographic recording medium as an object beam; a phase code mask (116 or 316) which is arranged in the reference optical system, has a required phase code pattern recorded as a hologram in advance as described in column 5, lines 42-67, and phase-spatial-modulates the reference beam; and an amplitude spatial light modulator (128) which is arranged in the object optical system and amplitude-spatial-modulates the object beam according to information to be recorded, wherein the phase-spatial-modulated reference beam and the amplitude-spatial-modulated object beam are projected onto the holographic recording medium (124) to

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thereby perform holographic recording of the information as described in column 5, lines 17-67 and column 16, lines 1-19.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis US 6,909,529 in view of Suganuma US 6,377,367.

In regard to claim 8, Curtis teaches (see for example, Figs. 4, 13) a holographic reproducing apparatus, comprising: a phase code mask (316) which has a phase code pattern recorded as a hologram and phase-modulates a projected laser beam by use of the phase code pattern; a laser beam source (310); a reference optical system (114, 118, 122) which projects the laser beam having the expanded beam diameter onto the phase code mask and guides a diffraction beam thereof to a holographic recording medium (124); a Fourier lens (118) disposed after the phase code mask in the reference optical system; and a CCD (129) which receives the diffraction beam formed from a reference beam projected onto the holographic recording medium to thereby reproduce information, wherein the information is phase-code-multiplex-recorded in the holographic recording medium in advance so as to correspond to the phase code

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pattern of the phase code mask as described in column 5, lines 17-67 and column 16, lines 1-19.

However, in regard to claim 8, Curtis does not teach a beam expander which expands a beam diameter of a laser beam from the laser beam source.

In regard to claim 8, Suganuma teaches a beam expander as described in column 11, lines 15-25. The known technique of using a beam expander in a holographic system would have predictable resulted in changing the diameter of the laser beam to an appropriate value for coupling to the rest of the holographic reproducing apparatus. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a beam expander in a holographic system for better optical coupling in the holographic system.

Allowable Subject Matter

6. Claim 10 is allowed.
7. Claims 3-7, 9 and 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. Claim 3 is allowable for at least the reason, "wherein the phase code pattern is angle-multiplex-recorded in the phase code mask" as set forth in the claimed combination. Claims 4, 11 and 12 are allowable due to their dependence on claim 3.

Claim 5 is allowable for at least the reason, "wherein the phase code pattern is spherical-shift-multiplex-recorded in the phase code mask" as set forth in the claimed combination. Claims 6, 13 and 14 are allowable due to their dependence on claim 5.

Claim 7 is allowable for at least the reason, "comprising a beam expander which expands a beam diameter of the laser beam from the laser beam source, and wherein: the phase code mask serves as means which branches the laser beam having the expanded beam diameter; and a diffraction beam of the laser beam in the phase code mask serves as the reference beam, and a transmission beam thereof serves as the object beam" as set forth in the claimed combination.

Claim 9 is allowable for at least the reason, "wherein: the phase code pattern is multiplex-recorded in the phase code mask and the information is phase-code-multiplex-recorded in the holographic recording medium; and the phase code mask is configured to be controllable by means of a mask driving device such that one of the recorded phase code patterns is recreated" as set forth in the claimed combination.

Claim 10 is allowable for at least the reason, "the phase code mask has the phase code pattern multiplex-recorded as a hologram and is configured to phase-modulate the projected reference beam by means of the phase code pattern" as set forth in the claimed combination.

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Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Curtis et al US 6,191,875 and Wilson et al US 6,697,180 are considered relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALESSANDRO AMARI whose telephone number is (571)272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ava
21 August 2008

/Alessandro Amari/
Primary Examiner, Art Unit 2872